Claims

What is claimed is:

1. A method for producing a stable chimeric plant having transgenic root tissue, the method comprising the steps of:
   obtaining an explant;
   inoculating the explant with *Agrobacterium rhizogenes* containing an exogenous genetic element capable of being transferred to the explant;
   culturing the inoculated explant in a manner permitting transgenic root development; and
   producing a stable chimeric plant with transgenic root tissue.
2. The method of claim 1 wherein the explant is stem or hypocotyl tissue.
3. The method of claim 1 wherein the explant is a hypocotyl providing a cut end below the cotyledon.
4. The method of claim 3 wherein the cut end of the hypocotyl is contacted with the *Agrobacterium rhizogenes*.
5. The method of claim 4 wherein the *Agrobacterium rhizogenes* is strain K599.
6. The method of claim 1 wherein the explant is obtained from a dicotyledonous plant.
7. The method of claim 6 wherein the plant is soybean, potato, or tomato.
8. The method of claim 4 wherein transgenic root development is initiated in the inoculated hypocotyl by placing the inoculated hypocotyl region in a media containing ¼ MS.
9. The method of claim 8 wherein the media further comprises a selectable agent.
10. The method of claim 9 wherein the selectable agent is kanamycin.
11. The method of claim 10 wherein the concentration of kanamycin in the media is no more than about 50 mg/L.
12. A method for testing a genetic element for functionality in a plant, comprising the steps of:
    obtaining an explant;
    inoculating the explant with *Agrobacterium rhizogenes* containing an exogenous

genetic element capable of being transferred to the explant;

culturing the inoculated explant in a manner permitting transgenic root development;

producing a stable chimeric plant with transgenic root tissue;

analyzing the transgenic root tissue for the exogenous genetic element.

13. The method of claim 12 wherein the exogenous genetic element is a gene that confers resistance to plant pathogens.

14. The method of claim 12 wherein the exogenous genetic element is a gene that confers an agronomic trait to the plant.

15. The method of claim 12 wherein the exogenous genetic element is a gene that is involved in the enzymatic or metabolic activity of the plant.

16. The method of claim 12 wherein the exogenous genetic element is a promoter sequence.

17. The method of claim 12 wherein the explant is selected from the group consisting of stem, hypocotyl or root tissue.

18. The method of claim 12 wherein the explant is a hypocotyl providing a cut end below the cotyledon.

19. The method of claim 18 wherein the cut end of the hypocotyl is contacted with the *Agrobacterium rhizogenes*.

20. The method of claim 19 wherein the *Agrobacterium rhizogenes* is strain K599.

21. The method of claim 12 wherein the explant is obtained from a dicotyledonous plant.

22. The method of claim 21wherein the plant is soybean, potato, or tomato.

23. The method of claim 19 wherein transgenic root development is initiated in the inoculated hypocotyl by placing the inoculated hypocotyl region in a media containing ¼ MS.

24. The method of claim 23 wherein the media further comprises a selectable agent.

25. The method of claim 24 wherein the selectable agent is kanamycin.

26. The method of claim 25 wherein the concentration of kanamycin in the media is no more than about 50 mg/L.